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Vepricardium eichhorsti, a new species from Vietnam (Bivalvia: Cardiidae)

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ABSTRACT A new species of genus *Vepricardium* Iredale, 1929 is described from Nha Trang, Khánh Hòa, Central Vietnam and compared to four other species of this genus.

INTRODUCTION The genus *Vepricardium* is a main genus of the subfamily Cardiinae Lamarck, 1809 with four species collected in Vietnam: *Vepricardium sinense* (Sowerby II, 1839), *Vepricardium coronatum* (Schröter, 1786), *Vepricardium asiaticum* (Bruguière, 1789) and *Vepricardium multispinosum* (Sowerby II, 1839). At the beginning of 2014, an hitherto unkown cockle was found. It was not included in the works by Lutaenko (2000), Hylleberg & Kilburn (2003), Thach (2005, 2007 and 2012). It belongs to *Vepricardium* and is described as new to science.

Abbreviations

ANSP = Academy of Natural Sciences, Philadelphia, USA
MNHN= Muséum National d'Histoire Naturelle, Paris, France
NMNS = National Museum of Nature and Science, Tokyo, Japan
NNT = Collection N.N.Thach
TE = Collection T.Eichhorst
RV = Right valve
SH = Shell height
SL = Shell length
SW = Shell width

SYSTEMATICS

Class Bivalvia Linnaeus, 1758
Family Cardiidae Lamarck, 1809
Subfamily Cardiinae Lamarck, 1809
Genus *Vepricardium* Iredale, 1929
Type species: *Vepricardium pulchricostatum* Iredale, 1929

Vepricardium eichhorsti n sp.

Figures 1-3, 5-7 and 9-11

Diagnosis. Shell with nearly symmetrical shape, long and nearly straight dorsal margin, highly raised and strongly calloused escutcheon and lunule.

Description. Shell subcircular in outline, nearly symmetrical in shape with mean SL 28-35mm in adult size (measured on seven specimens). Anterior margin more curved than posterior one. Dorsal margin long and nearly straight, ventral margin strongly convex and highly crenulated. Shell slightly longer than high with SL 107% SH (see table 1). Valves rather inflated with SW 73.5% SH (table 1) and not closing tightly at both anterior and posterior ends. Sculpture consisting of about 22 rounded radial ribs (table

1) bearing numerous small granules with wide interspaces between ribs. Escutcheon and lunule solid heavily calloused and white in color. Ligament exterior rounded and brown, umbones broad high and nearly touching. Hinge long with strong teeth. Pallial sinus lacking, pallial line entire and well separated from ventral margin. Posterior adductor scar ovate, periostracum moderately thick. Color exteriorly whitish and interiorly white.

Type material.
Holotype 34.8mm long in ANSP (Fig.1). Paratypes: all from type locality, Paratype 1: 33.5mm long in NMNS (Fig.2). Paratype 2: 28.4mm long in MNHN (Fig.3). Paratype 3: 38.1mm long in NNT (Fig.10). Paratype 4: 36.1mm long in NNT (Fig.11). Paratype 5: 34.8mm long in TE (Fig.7). Paratype 6: 38.4mm long in NNT (not illustrated).

Type locality. Nha Trang, Khánh Hòa Province, Central Vietnam.

Range and habitat. along the coast of Central Vietnam, from Bình Thuận to Bình Định Provinces. Type specimens were collected at 5-20m depth on muddy sand.

Etymology. This new species was named in honor of Thomas Eichhorst of USA for his contribution to the development of conchology of the world.

Specimen No	SL (mm)	SH (mm)	SL/SH	Mean SL/SH	SW (mm)	SW/SH	Mean SW/SH	Number of ribs (RV)	Mean Number of ribs
Holotype	34.8	32.5	1.071	1.07 (107%)	24.0	0.738	0.735 (73.5%)	21	21.71 ribs
Paratype 1	33.5	31.4	1.067		22.8	0.726		21	
Paratype 2	28.4	26.8	1.060		18.8	0.701		22	
Paratype 3	38.1	35.0	1.089		25.5	0.729		22	
Paratype 4	36.1	32.8	1.101		24.7	0.753		23	
Paratype 5	34.8	33.0	1.055		25.3	0.767		21	
Paratype 6	38.4	35.5	1.082		26.0	0.732		22	

Table 1. SL/SH, SW/SH and Number of radial ribs of *Vepricardium eichhorsti* n sp.

Discussion. *Vepricardium eichhorsti* n sp. is closest to *Vepricardium sinense* (Sowerby, 1839) but differs in six stable characters that are summarized in Table 2.

- *Vasticardium eichhorsti* differs from *Vepricardium coronatum* (Schröter, 1786) in more symmetrical shape, less numerous radial ribs and lack of long ends of these ribs along margins.

- *Vepricardium eichhorsti* differs from *Vepricardium asiaticum* (Bruguière, 1789) in less swollen shape, smaller adult size, less numerous radial ribs, highly raised lunule and lower umbones.

- *Vepricardium eichhorsti* differs from *Vepricardium multispinosum* (Sowerby II, 1839) in much smaller adult size, rounded radial ribs and lack of strong spines on these ribs.

	Vepricardium eichhorsti	*Vepricardium sinense*	*Vepricardium coronatum*	*Vepricardium asiaticum*	*Vepricardium multispinosum*
Mean size	28-35mm	30-40mm	25-35mm	45-55mm	50-60mm
Shape	Subcircular, nearly symmetrical	Ovate, narrowing posteriorly	Ovate, tapering posteriorly	Ovate	Ovate
Dorsal margin	Nearly straight	Strongly arched	Descending posteriorly	Slightly arched	Slightly arched
Radial ribs	Rounded and widely spaced	Inverted -V shaped,widely-spaced	Ribs extend over ventral margin	Round topped slightly spinous	Round topped, strongly spinous
Escutcheon & Lunule	Heavily calloused and highly raised	Escutcheon strongly inflated	Calloused and raised	Escutcheon slightly raised, lunukle calloused	Escutcheon raised, lunule concave
Posterior adductor scar	Ovate	Elongate ovate	Elongate ovate and red	Elongate ovate	Ovate and not well visibe

Table 2. Comparison of *Vepricardium eichhorsti* vs. *Vepricardium sinense, Vepricardium coronatum, Vepricardium asiaticum, Vepricardium multispinosum*

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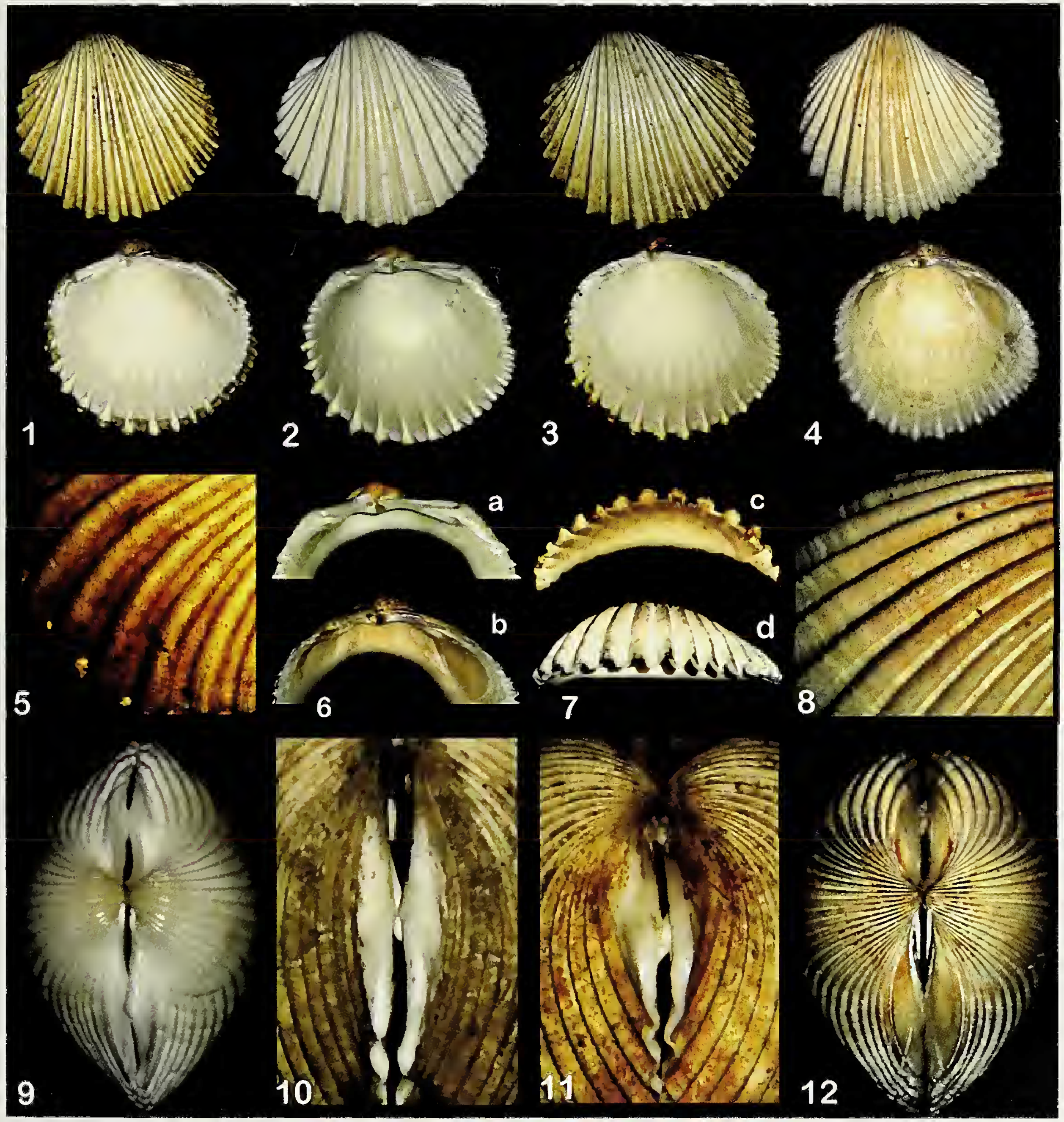

Figures. 1-3: ***Vepricardium eichhorsti*** n.sp., Nha Trang, Vietnam- **1**: Holotype 34.8mm SL, ANSP- **2**: Paratype 1: 33.5mm SL, NMNS. **3**: Paratype 2: 28.4mm SL, MNHN- **4**: ***Vepricardium sinense*** 45.2mm SL, Vietnam for comparison- **5-7**: ***Vepricardium eichhorsti*** n.sp.- **5**: Detail of radial ribs, specimen 34.8mm SL (Paratype 5)- **6**: Hinge of Paratype 1 (a) compared to that of *Vepricardium sinense* (b) - **7**: Profile of radial ribs of Paratype 5 (c) compared to those of *Vepricardium sinense* (d)- **8**: ***Vepricardium sinense*** specimen 45.2mm SL with detail of radial ribs for comparison- **9-11**: ***Vepricardium eichhorsti*** n.sp.- **9**: Dorsal view of Paratype 1- **10**: Escutcheon of Paratype 3- **11**: Lunule of Paratype 4- **12**: ***Vepricardium sinense*** 45.2mm SL dorsal view for comparison.